WHAT IS CLAIMED IS:

1. A method for activating and protecting cytotoxic lymphocytes in the presence of monocytes (MO), comprising:

identifying a subject in need of enhanced cytotoxic lymphocyte activity; and

administering to the patient an amount of diphenylionodonium (DPI), effective to activate and protect cytotoxic lymphocyte function in the presence of MO.

2. The method of Claim 1, further comprising administering an effective amount of a cytotoxic lymphocyte stimulatory composition to the subject, wherein said cytotoxic lymphocyte stimulatory composition is selected from the group consisting of a vaccine adjuvant, a vaccine, a peptide, a cytokine, and a flavonoid.

3. The method of Claim 2, wherein the composition is a vaccine adjuvant selected from the group consisting of bacillus Calmette-Guerin (BCG), pertussis toxin (PT), cholera toxin (CT), *E. coli* heat-labile toxin (LT), mycobacterial 71-kDa cell wall associated protein, microemulsion MF59, microparticles of poly(lactide-co-glycolides)(PLG), and immune stimulating complexes (ISCOMS).

4. The method of Claim 2, wherein the composition is a vaccine selected from the group consisting of influenza vaccines, human immunodeficiency virus vaccines, *Salmonella enteritidis* vaccines, hepatitis B vaccines, *Boretella bronchiseptica* vaccines, tuberculosis vaccines, allogeneic cancer vaccines, and autologous cancer vaccines.

5. The method of Claim 2, wherein the composition is a cytokine selected from the group consisting of IL-1, IL-2, IL-12, IL-15, IFN-α, IFN-β, or IFN-γ.

6. The method of Claim 2, wherein the composition is a flavonoid selected from the group consisting of flavone acetic acids and xanthenone-4-acetic acids.

7. The method of Claim 2, wherein said cytotoxic lymphocyte stimulatory composition is administered in a daily dose of between 1000 and 600,000 U/kg.

8. The method of Claim 1, further comprising administering of an effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) selected from the group consisting of histamine, histamine

dihydrochloride, histamine phosphate, serotonin, dimaprit, clonidine, tolazoline, impromadine, 4-methylhistamine, betazole, and a histamine congener.

9. The method of Claim 8, wherein said effective amount is between 0.05 and 50 mg per dose.

10. The method of Claim 8, wherein said effective amount is between 1 and 500 μg/kg of patient weight per dose.

11. The method of Claim 1, wherein the administration of said cytotoxic lymphocyte stimulatory composition and said effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) is performed within 1 hour.

12. The method of Claim 1, wherein the administration of said cytotoxic lymphocyte stimulatory composition and said effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) is performed within 24 hours.

13. The method of Claim 8, wherein said intercellular reactive oxygen metabolite is hydrogen peroxide.

14. The method of Claim 13, further comprising administering an effective amount of a scavenger of intercellular hydrogen peroxide.

15. The method of Claim 14, wherein the scavenger is selected from the group consisting of catalase, glutathione peroxidase, and ascorbate peroxidase.

16. The method of Claim 14, wherein said hydrogen peroxide scavenger is administered in a dose of from about 0.05 to about 50 mg/day.

17. The method of Claim 14, wherein said effective amount of DPI, said cytotoxic lymphocyte stimulatory composition and said scavenger of hydrogen peroxide are administered separately.

18. The method of claim 1, further comprising the administering a chemotherapeutic agent.

19. The method of claim 18, wherein the chemotherapeutic agent comprises an anticancer agent selected from the group consisting of cyclophosphamide, chlorambucil, melphalan, estramustine, iphosphamide, prednimustin, busulphan, tiottepa, carmustin, lomustine, methotrexate, azathioprine, mercaptopurine, thioguanine,

cytarabine, fluorouracil, vinblastine, vincristine, vindesine, etoposide, teniposide, dactinomucin, doxorubin, dunorubicine, epirubicine, bleomycin, nitomycin, cisplatin, carboplatin, procarbazine, amacrine, mitoxantron, tamoxifen, nilutamid, and aminoglutemide.

20. The method of claim 18, wherein the chemotherapeutic agent comprises an antiviral agent selected from the group consisting of idoxuridine, trifluorothymidine, adenine arabinoside, acycloguanosine, bromovinyldeoxyuridine, ribavirin, trisodium phosphophonoformate, amantadine, rimantadine, (*S*)-9-(2,3-Dihydroxypropyl)-adenine, 4',6-dichloroflavan, AZT, 3'(-azido-3'-deoxythymidine), ganciclovir, didanosine (2',3'-dideoxyinosine or ddI), zalcitabine (2',3'-dideoxycytidine or ddC), dideoxyadenosine (ddA), nevirapine, inhibitors of the HIV protease, and other viral protease inhibitors.

21. The method of claim 18, wherein administering said effective amount of DPI, said cytotoxic lymphocyte stimulatory composition, said compound that inhibits the production or release of intercellular hydrogen peroxide and said chemotherapeutic agent are performed concomitantly.

22. A composition comprising a cytotoxic lymphocyte protecting amount of diphenylionodonium (DPI) in a pharmaceutically acceptable carrier.

23. The composition of Claim 22, further comprising a cytotoxic lymphocyte stimulatory compound selected from the group consisting of a vaccine adjuvant, a vaccine, a peptide, a cytokine, and a flavonoid.

24. The composition of Claim 23, wherein the compound is a vaccine adjuvant selected from the group consisting of bacillus Calmette-Guerin (BCG), pertussis toxin (PT), cholera toxin (CT), *E. coli* heat-labile toxin (LT), mycobacterial 71-kDa cell wall associated protein, microemulsion MF59, microparticles of poly(lactide-co-glycolides)(PLG), and immune stimulating complexes (ISCOMS).

25. The composition of Claim 23, wherein the compound is a vaccine selected from the group consisting of influenza vaccines, human immunodeficiency virus vaccines, *Salmonella enteritidis* vaccines, hepatitis B vaccines, *Boretella bronchiseptica* vaccines, tuberculosis vaccines, allogeneic cancer vaccines, and autologous cancer vaccines.

26. The composition of Claim 23, wherein the compound is a cytokine selected from the group consisting of IL-1, IL-2, IL-12, IL-15, IFN-α, IFN-β, or IFN-γ.

27. The composition of Claim 23, wherein the compound is a flavonoid selected from the group consisting of flavone acetic acids and xanthenone-4-acetic acids.

28. The composition of Claim 23, wherein said cytotoxic lymphocyte stimulatory composition is administered in a daily dose of between 1000 and 600,000 U/kg.

29. The composition of Claim 22, further comprising an effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) selected from the group consisting of histamine, histamine dihydrochloride, histamine phosphate, serotonin, dimaprit, clonidine, tolazoline, impromadine, 4-methylhistamine, betazole, and a histamine congener.

30. The composition of Claim 29, wherein said effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) is between 0.05 and 50 mg per dose.

31. The composition of Claim 29, wherein said effective amount of a compound that inhibits the production or release of intercellular reactive oxygen metabolites (ROM) is between 1 and 500 μg/kg of patient weight per dose.

32. The composition of claim 22, further comprising a chemotherapeutic agent.

33. The composition of claim 32, wherein the chemotherapeutic agent comprises an anticancer agent selected from the group consisting of cyclophosphamide, chlorambucil, melphalan, estramustine, iphosphamide, prednimustin, busulphan, tiottepa, carmustin, lomustine, methotrexate, azathioprine, mercaptopurine, thioguanine, cytarabine, fluorouracil, vinblastine, vincristine, vindesine, etoposide, teniposide, dactinomucin, doxorubin, dunorubicine, epirubicine, bleomycin, nitomycin, cisplatin, carboplatin, procarbazine, amacrine, mitoxantron, tamoxifen, nilutamid, and aminoglutemide.

34. The composition of claim 32, wherein the chemotherapeutic agent comprises an antiviral agent selected from the group consisting of idoxuridine,

trifluorothymidine, adenine arabinoside, acycloguanosine, bromovinyldeoxyuridine, ribavirin, trisodium phosphophonoformate, amantadine, rimantadine, (*S*)-9-(2,3-Dihydroxypropyl)-adenine, 4',6-dichloroflavan, AZT, 3'(-azido-3'-deoxythymidine), ganciclovir, didanosine (2',3'-dideoxyinosine or ddI), zalcitabine (2',3'-dideoxycytidine or ddC), dideoxyadenosine (ddA), nevirapine, inhibitors of the HIV protease, and other viral protease inhibitors.